

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED / ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER P64393US0
		US APPLICATION NO (if known, see 37 CFR 1.52) 09/462506
INTERNATIONAL APPLICATION NO PCT/GB98/02168	INTERNATIONAL FILING DATE 20 July 1998	PRIORITY DATE CLAIMED 24 July 1997
TITLE OF INVENTION INDUSTRIAL FABRICS AND METHOD OF TREATMENT		
APPLICANT(S) FOR DO/EO/US Ian Christison SAYERS		

Applicant herein submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for Internatl. Preliminary Examination was made by the 19th month from earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ A translation of the annexes to the Internatl. Preliminary Examination report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

International Search Report (EPO)
PCT Request Form
PCT/IB/304 Form
PCT/IB/308 Form
First Page of Publication
International Preliminary Examination Report (w/Annexes)

US APPLICATION NO (if known, see 37 CFR 1.5) 09/462506		INTERNATIONAL APPLICATION NO PCT/GB98/02168		ATTORNEY'S DOCKET NUMBER P64393US0	
17. <input checked="" type="checkbox"/> The following fees are submitted: Basic National Fee (37 CFR 1.492(a)(1)-(5)): Internatl. prelim. examination fee paid to USPTO (37 CFR 1.492 (a) (1)) .. \$670.00 No international preliminary examination fee paid to USPTO (37 CFR 1.492 (a) (2)) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) .. \$760.00 Neither international preliminary examination fee (37 CFR 1.492 (a) (3)) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO) \$970.00 International preliminary examination fee paid to USPTO (37 CFR 1.492 (a) (4)) and all claims satisfied provisions of PCT Article 33(2)-(4) \$96.00 Search Report prepared by the EPO or JPO (37 CFR 1.492 (a) (5)) \$840.00 <div style="text-align: right;">ENTER APPROPRIATE BASIC FEE AMOUNT =</div>				CALCULATIONS	PTO USE ONLY
				\$ 840.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 130.00	
Claims	Number Filed	Number Extra	Rate		
Total Claims	25 - 20 =	-5-	x \$18.00	\$ 90.00	
Independent Claims	2 - 3 =	-0-	x \$78.00	\$	
Multiple Dependent Claim(s) (if applicable)			+ \$260.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 1060.00	
Reduction by 1/2 for filing by small entity , if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 1060.00	
Processing fee of \$130 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f))				\$	
TOTAL NATIONAL FEE =				\$ 1060.00	
Fee of \$40.00 for recording the enclosed assignment (37 CFR 1.21(h)). Assignment must be accompanied by appropriate cover sheet (37 CFR 3.28, 3.31).				\$	
TOTAL FEES ENCLOSED =				\$ 1060.00	
				Amt. to be refunded:	\$
				Amt. charged:	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>1060.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. <u>06-1358</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge my account any additional fees set forth in §1.492 during the pendency of this application, or credit any overpayment to Deposit Account No. <u>06-1358</u> . A duplicate copy of this sheet is enclosed.					
SEND ALL CORRESPONDENCE TO: Jacobson, Price, Holman & Stern, PLLC 400 7th Street, N.W., Suite 600 Washington, DC 20004 202-638-6666 CUSTOMER NUMBER: 00136				By <u>Harvey B. Jacobson, Jr.</u> Harvey B. Jacobson, Jr. Reg. No. 20,851	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Ian Christison SAYERS
Serial No.: New
Filed: January 24, 2000
For: INDUSTRIAL FABRICS AND METHOD OF TREATMENT

PRELIMINARY AMENDMENT TO LESSEN FEES

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE CLAIMS

Claim 3, line 1, delete "or 2";
Claim 4, line 1, delete "or 2";
Claim 5, line 1, delete "or 2";
Claim 9, line 1, delete "or 2";
Claim 10, line 1, delete "or 2";
Claim 11, line 1, delete "any preceding claim",
insert --claim 1,--;
Claim 21, line 1, delete "any one of claims 12 to 20",
insert --claim 20--;
Claim 24, line 1, delete "or method";
Claim 24, line 1, delete "any preceding claim",
insert --claim 1--;
Claim 25, line 1, delete "or method";
Claim 25, line 1, delete "any preceding claim",
insert --claim 1--.

REMARKS

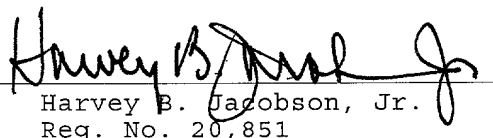
The foregoing Preliminary Amendment is requested in order to delete the multiple dependent claims and avoid paying the multiple dependent claims fee.

Early action on the merits is respectfully requested.

Respectfully submitted,

JACOBSON, PRICE, HOLMAN & STERN, PLLC

By


Harvey B. Jacobson, Jr.
Reg. No. 20,851

400 Seventh Street, N.W.
Washington, D.C. 20004-2201
(202) 638-6666
Date: January 24, 2000
Atty. Docket: P64393US0
HBJ:crj

INDUSTRIAL FABRICS AND METHOD OF TREATMENT

This invention relates to industrial fabrics and to a method of treating such fabrics during the manufacture thereof to impart desired characteristics to the fabric.

5 The invention relates for example to all forms of papermaking machine fabrics including dryer fabrics, press felts, including extended nip press belts, shoe press sleeves, corrugator machine press belts, and also to conveyor belts, printing blankets, silicon wafer grinding belts and filter cloths.

10 These fabrics may be treated for example to influence the wetting characteristics of the fabric, or in a composite fabric of two or more layers, of at least one layer of the fabric. Thus it is known e.g from US 5372876, to provide e.g. a papermaking felt which includes a flow control layer formed of a porous hydrophobic material. Conversely, EP-A-0761872
15 discloses a dryer fabric having a paper side contact surface which is hydrophilic, to improve adhesion between the paper web and the dryer fabric.

20 In both cases, the hydrophilic or hydrophobic properties of the layer or surface are achieved by coating or chemical treatment by application of the relevant compositions in a liquid medium.

As a method and means for treating substrates to influence their

-2-

surface characteristics, the technology of plasma treatment is in the process of being developed. A 'plasma' is a fluid state of matter wherein due to excitation, the matter is present in the form of positive and negative ions. Polar molecules may be dissociated into anionic and cationic radicals, whilst
5 free atoms lose electrons to form free electrons and positively charged atoms - depending upon the degree of excitation, more than one electron may be stripped from atomic shells. Plasmas can exist over an extremely wide range of temperature and pressure; from over atmospheric to near vacuum. Because matter in the plasma exists in the form of charged ions,
10 the plasma environment is extremely chemically energetic, and it has been proposed to treat the surfaces of materials by exposure to plasmas of selected composition.

It is an object of the present invention to provide fabrics for use in industrial processes, such as in papermaking machines, conveyor belts,
15 printing blankets and filtration fabrics by way of non-limiting example, which have had surface properties modified by plasma treatment, as an economical and environmentally improved alternative to treatment or coating with a liquid medium.

According to the invention papermaking or filter fabric comprises or
20 includes a layer or component of synthetic yarns or fibres which have been subjected to plasma treatment.

AMENDED SHEET

From another aspect the invention provides a method of making or preparing papermaking or filter fabric including the step of subjecting at least one surface of a layer or component of the fabric comprised of synthetic yarns or fibres to plasma treatment.

5 The invention also includes apparatus for use in making or preparing papermaking or filter fabric, including a plasma chamber to which material containing synthetic yarns or fibres comprising or for use in making said fabric may be introduced, and removed after treatment.

10 The purpose of the plasma treatment may be to modify the wetting characteristics of the yarn or fibre surface being treated, i.e. to render the surface hydrophobic or hydrophilic.

15 Alternatively the yarn or fibre surface is provided with activated sites to improve subsequent coating or dyeing. This treatment may utilise glow discharge dielectric barrier discharge or spray discharge plasma. Compared with corona discharge treatment techniques the modified characteristics of the treated surface are permanent and far more durable.

Other characteristics can be enhanced by appropriate choice of composition of the plasma, e.g. improved softness in drying felts especially for tissue making machines, crease resistance and antistatic properties.

20 In a preferred method of the invention, hydrophilic properties are enhanced by subjecting the surface to a plasma comprising or containing

-4-

oxygen, air or ammonia for example.

In another preferred method of the invention, hydrophobic properties are enhanced by subjecting the surface to a plasma comprising or containing a silane, e.g. $\text{Si}(\text{CH}_3)_4$, a siloxane, e.g. $(\text{Si}(\text{OCH}_3)_4)$ or a
5 perfluorocarbon, e.g. 1-6C perfluoroalkane or tetrafluoroethylene or a combination thereof.

Hard coatings of e.g. carbon may be formed by subjecting the surface to a plasma comprising or containing hydrocarbon e.g. methane. Heat resistant coatings can be applied by using a plasma comprising or containing
10 halogenated hydrocarbons or unsaturated amines (e.g. tetrachloroethylene; 1,1,2-trichloroethane; allylamine or trichloroethylene). The plasma may be diluted with a diluent gas such as helium.

The synthetic yarn or fibre containing material may be treated in the form of a ready made up layer or web or as fibres or yarns prior to weaving
15 or making up the layer.

The apparatus may be arranged so that only one surface of a fabric is exposed to plasma treatment.

The apparatus of the invention may comprise means for continuously introducing the material into the plasma chamber, moving the material
20 through the chamber during treatment, and causing it to leave the chamber after treatment. Alternatively the material may be introduced to the plasma

-5-

chamber in batches, which are subjected to treatment and then removed.

The operating pressure of the plasma chamber may be from in the order of 0.1-3.0 mbar, up to and above 1 atmosphere.

A preferred embodiment of the invention will now be described by way of example, and with reference to the accompanying drawing, which is a diagrammatic view of a plasma treatment machine according to the invention.

In the preferred embodiment, a fabric 10 e.g. a woven or nonwoven web of synthetic yarns or fibres destined to form all or part of an industrial fabric such as a paper machine press felt, dewatering drying or forming belt, is fed from a dispensing station 11. This is shown simply as a feed roll, but would in practice include guide and compensating devices in addition, as is well known in the art. The fabric 10 is introduced through a self-sealing entry slot 12 into a plasma chamber 13, and exits through a similar self-sealing exit slot 14 after passing through the plasma chamber and being subjected to plasma treatment within the chamber. The treated fabric 10 is then taken up on a winding station 15 which is shown as a simple take up roll, but in practice would include such guide and compensating apparatus as is required, as is well known in the art.

The fabric 10 enters and leaves the chamber 13 through self-sealing slots 12 and 14 as the plasma usually operates at a considerable under-

-6-

pressure, often extremely rarified, e.g. 0.1-3.0 mbar; and sometimes contains components which must not be allowed into the ambient.

To achieve plasma conditions, the chamber 13 is evacuated to the required pressure by pump means acting under pressure control 16. The material to form the plasma is introduced at 17, and excitation proceeds by the creation of an intense electrical field between electrodes 18, 19 subject to a controller 20. The plasma is created by ionising the molecules or atoms of the plasma forming material to form ionised radicals, or to provide free electrons and positively charged atoms.

Treatment is achieved by exposing one or both surfaces of the fabric to the plasma within chamber 13.

The composition of the plasma will be selected in accordance with the objective of the treatment. For example, to improve wettability (hydrophilic) properties of a fabric, the plasma may be created from ordinary air, oxygen, ammonia or a mixture of these.

To provide a water-repellant finish (hydrophobic) the plasma may be created from a siloxane or perfluorocarbon compound.

Examples of other properties which may be enhanced by such plasma treatment are softness (oxygen plasma), crease resistance (dipped in DMSO, then exposed to nitrogen plasma); anti-static finish - chloro (chloromethyl) dimethylsilane plasma; oil repellent finishes, improvement of capillarity, dye

-7-

reception, dyeing depth, bleaching, UV-protection and flame retardancy may also be provided for.

The fabric may instead of being fed continuously as illustrated, be placed in the machine in batches, treated and then removed. The fabric
5 may be placed on a conveyor to be fed through the chamber, or associated with a backing layer when only one surface is to be treated.

The material to be treated may be in the form of synthetic fibres or yarns prior to making up into a woven or nonwoven fabric and such are particularly suited to a conveyor feed, or to batch treatment e.g in mesh
10 cages which can be introduced to and removed from the plasma chamber.

A hydrophobic (water repellant) fabric may be used as a flow control layer in a papermaking felt of the kind described in US, 5,372,876, whilst a hydrophilic (with enhanced wettability) fabric may be used as a dryer fabric such as described in EP-A-0761872 mentioned above.

15 The term 'fabric' as used above should be interpreted to cover sintered felts, coatings of coated papermaking fabrics, nonwovens and films, spiral link structures, membranes or polymer matrix material and their components prior to making up where appropriate e.g. sintered particles.

The speed of material being fed into the chamber in the illustrated
20 version may be 5-100 metres per minute. At present working widths are limited to about 2.7 metres. The development of larger machines capable

-8-

of treating greater web widths is hindered by the practical difficulties associated in maintaining a sufficient vacuum in a larger chamber. It is thus often more convenient to treat yarns and fibres or other fabric constituents rather than finished fabrics.

5 A hydrophilic surface for a dryer fabric, as in EP-A-0761872 obtains improved adhesion between the dryer fabric and the paper web. A hydrophobic surface may be desirable for certain dryer fabrics for contaminant release, whilst forming fabrics may be rendered hydrophobic for the same reasons or may be hydrophilic to improve drainage. It is
10 believed that a very thin film of water is attracted to the surface of the yarns in the fabric providing "lubrication" for water flowing through the interstices of the fabric. Batt staple fibres in press felts can be rendered hydrophilic to make the felts absorb water better initially, improving the conditioning of the felt and thereby reducing start up times. However, a
15 layer of hydrophobic batt staple fibres (or base cloth yarns) within the felt can form an anti-rewetting or flow control layer, which hinders the return flow to the web of water which has initially been urged into the felt from the paper (as in US 5372876).

20 A further possible use of the invention is by plasma treatment of yarns, fibres, films or membranes used to reinforce polymer matrices to form belts, such as extended nip press belts, shoe press sleeves, press belts

-9-

for corrugator machines, conveyor belts, printing blankets, silicon wafer grinding belts, or carcass stripping belts. The activated groups formed on the reinforcing substrate surfaces improve bonding with the matrix polymer. This is particularly useful for reinforcing a polyurethane matrix with polyester structural members such as yarns, fibres or fabrics (woven, nonwoven spiral link or membrane), the latter having excellent dimensional stability but poor adhesion to polyurethane. Adhesion may be improved by a factor of 2-3. For this purpose ammonia or nitrogen plasmas are preferred. Yarns, fibres, films, membranes or finished fabrics may be treated by plasma according to the invention to provide hydrophobic coatings for filter cloths (especially those used in dust filtration) to improve cake release.

In some cases, only one surface of the fabric is exposed to plasma treatment. This may be used e.g. for a forming fabric which may be rendered hydrophilic on the machine side. This will reduce rewetting of the web between a couch roll and felt pick-up at the end of a forming section by increasing solids content in the web by as much as 1-3%. This can entail a significant cost saving for the papermaker.

Plasma treatment as outlined above has the advantages that the process is solvent free, (including no use of water), very small amounts of the raw materials are required (e.g. 30-100 mg per m² fabric); energy

-10-

consumption is low, as no water is used which absorbs heat; labour costs are negligible, as the process can be automated, and the overall cost per unit area of fabric can be very low.

5 The invention is applicable to all industrial fabrics, including conveyor belts and filter cloths, but is mainly directed to all forms of paper machine clothing.

CLAIMS

1. A papermaking fabric or filter fabric comprising or including a layer or component of synthetic yarns or fibres, which have been subjected to plasma treatment.

5 2. A papermaking or filter fabric according to claim 1, wherein said fabric includes a layer comprised of synthetic yarns or fibres, a surface of which layer has been subjected to plasma treatment.

10 3. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres subjected to plasma treatment are provided with activated sites to improve subsequent coating or dyeing.

4. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing oxygen, air or ammonia.

15 5. A papermaking or filter fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing silane, siloxane, or a perfluorocarbon.

6. A papermaking or filter fabric according to claim 5, wherein said silane is $\text{Si}(\text{CH}_3)_4$.

20 7. A papermaking or filter fabric according to claim 5, wherein said siloxane is $\text{Si}(\text{OCH}_3)_4$.

8. A papermaking or filter fabric according to claim 5, wherein said

perfluorocarbon is 1-6C perfluoroalkane, or tetrafluoroethylene or a combination thereof.

9. A papermaking or filter fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing a hydrocarbon.

10. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing one or more halogenated hydrocarbons or unsaturated amines.

11. A papermaking or filter fabric according to any preceding claim, wherein the plasma is diluted by helium.

12. A method of making or preparing papermaking or filter fabric including the step of subjecting at least one surface of a layer or component of the fabric which comprises or includes synthetic yarns or fibres to plasma treatment.

13. A method according to claim 12, wherein said plasma treatment provides activated sites to improve subsequent coating or dyeing.

14. A method according to claim 12, wherein the plasma contains oxygen, air or ammonia.

15. A method according to claim 12, wherein the plasma contains a silane, a siloxane, or a perfluorocarbon.

16. A method according to claim 15, wherein the silane is $\text{Si}(\text{CH}_3)_4$.

17. A method according to claim 15, wherein siloxane is $\text{Si}(\text{OCH}_3)_4$.

18. A method according to claim 15, wherein the perfluorocarbon is 1-6C perfluoroalkane, tetrachloroethylene, or a combination thereof.

5 19. A method according to claim 12, wherein the plasma contains a hydrocarbon.

20. A method according to claim 12, wherein the plasma contains one or more halogenated hydrocarbons or unsaturated amines.

21. A method according to any one of claims 12 to 20, wherein the plasma is diluted by helium.

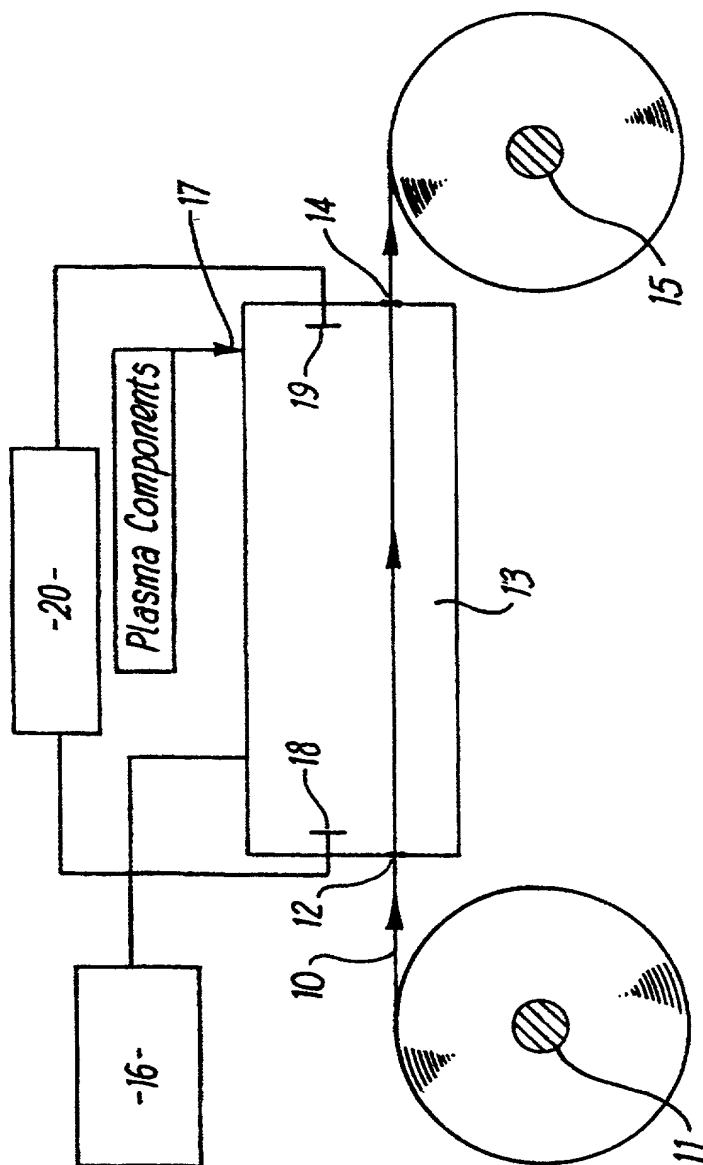
10 22. Apparatus for use in the method of claim 12, including a plasma chamber to which material comprising synthetic yarns or fibres forming part of or for use in making a fabric can be introduced and removed after treatment.

15 23. Apparatus according to claim 22, comprising means for continuously introducing material into the plasma chamber, means for moving the material through the chamber during treatment, and means for causing the material to leave the chamber after treatment.

20 24. A fabric or method according to any preceding claim, wherein the synthetic fibres are in the form of yarns to be made up into a woven or nonwoven layer.

25. A fabric or method according to any preceding claim, wherein the

1/1



ALL PATENTS, INCLUDING DESIGN
FOR APPLICATION BASED ON PCT, PARIS CONVENTION;
NON PRIORITY; OR PROVISIONAL APPLICATIONS

DECLARATION
AND POWER OF ATTORNEY
U.S.A.

FOR ATTORNEY'S USE ONLY

ATTORNEY'S DOCKET NO.

As a below named inventor, I declare that my residence, post office address and citizenship are stated below next to my name, the information given herein is true, that I believe that I am the original, first and sole inventor (if only one name is listed at 201 below), or a first and joint inventor (if plural inventors are named below at 201-203, or on additional sheets attached hereto) of the subject matter which is claimed and for which patent is sought on the invention entitled:

INDUSTRIAL FABRICS AND METHOD OF TREATMENT

which is described and claimed in ☒ PCT International Application No. PCT/GB98/02168 filed 20th July 1998
☐ the attached specification ☐ the specification in application (if applicable) and filed

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

9715508.9

(Number)

United Kingdom

(Country)

24 July 1998

(Day/Month/Year Filed)

Priority Claimed

☒ Yes

☐ No

☐ Yes

☐ No

☐ Yes

☐ No

☐ Yes

☐ No

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below

Application No.

Filing Date

Application No.

Filing Date

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status: patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys (Registration No.) to prosecute this application, receive and act on instructions from my agent, and transact all business in the Patent and Trademark Office connected therewith. HARVEY B. JACOBSON JR. (20,851); D. DOUGLAS PRICE (24,514); JOHN CLARKE HOLMAN (22,769); MARVIN R. STERN (20,640); MICHAEL R. SLOBASKY (26,421); JONATHAN L. SCHERER (29,851); IRWIN M. AISENBERG (19,007); WILLIAM E. PLAYER (31,409); and YOON S. HAM (45,307).

SEND CORRESPONDENCE TO:

JACOBSON, PRICE, HOLMAN & STERN
PROFESSIONAL LIMITED LIABILITY COMPANY
400 SEVENTH STREET N.W.
WASHINGTON, DC. 20004

DIRECT TELEPHONE CALLS TO:

(please use Attorney's Docket No.) (202) 638-6666

JACOBSON, PRICE, HOLMAN & STERN
PROFESSIONAL LIMITED LIABILITY COMPANY

Inventor(s) name must include at least one unabbreviated first or middle name.

	FULL NAME OF INVENTOR *	FAMILY NAME	GIVEN NAME	MIDDLE NAME
201	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE OR COUNTRY
				ZIP CODE
202	FULL NAME OF INVENTOR *	FAMILY NAME	GIVEN NAME	MIDDLE NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE OR COUNTRY
203	FULL NAME OF INVENTOR *	FAMILY NAME	GIVEN NAME	MIDDLE NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE OR COUNTRY
			ZIP CODE	

I further declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon

SIGNATURE OF INVENTOR 201 *	SIGNATURE OF INVENTOR 202 *	SIGNATURE OF INVENTOR 203 *
DATE	DATE	DATE
<u>24/01/00</u>		

□ Additional inventors are named on separately numbered sheets attached hereto.
© JPH&S 1995 8/95; 3/96; 5/98 (COPYING WITHOUT DELETIONS PERMITTED)